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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/719,654	11/21/2003	J. David Irvine		2373

7590 11/09/2004

Attention to Thomas A. O'Rourke
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EXAMINER

LEUNG, RICHARD L

ART UNIT PAPER NUMBER

3744

DATE MAILED: 11/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/719,654

Applicant(s)

IRVINE ET AL.

Examiner

Richard L. Leung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☒ Claim(s) 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Information Disclosure Statement

1. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Drawings

2. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because the drawings appear informal, and it is especially difficult to discern the different elements referenced in Fig. 2. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 48, 50, 54, and 56.

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the dam recited by claim 7, the baffle recited by claim 8, the cascading raceway recited by claims 13 and 24, the linear raceway recited by claims 12 and 23, the wire mesh conveyor belt recited by claims 18 and 28, the screen conveyor belt recited by claims 19 and 29, and the U-

shaped cross-section recited by claims 15 and 26 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

5. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

6. Claim 20 is objected to because of the following informalities: the claim recites the limitation "said sump." There is insufficient antecedent basis for this limitation in the claim since the term "sump" is not mentioned in any preceding claims. It is suggested that "sump" be changed to --reservoir--. Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 3-12, and 30-32 are rejected under 35 U.S.C. 102(b) as being anticipated by US 4479363 (Gibson et al.).

Regarding claims 1 and 3-12, Gibson et al. disclose a method for treating a substance in a cryogen comprising transporting said cryogen, which may be liquid nitrogen, from a reservoir (sump 34) using a lift pump into a horizontal flow of said cryogen (defined by reservoir 18 and trough 22), depositing a substance into said horizontal flow of said cryogen using nozzles (12), passing said substance and said cryogen into a linear raceway (trough 22 with channels 24), and separating said substance from said cryogen (by slots 30 in drum 28). Gibson et al. further disclose that said cryogen is adjusted by a control means, comprising a dam or baffle (20) and a screen (perforated plate 103), that is understood to slow down the horizontal flow of said cryogen, reduce any back eddies and/or reverse currents, and create a generally smooth surface on said cryogen. See particularly column 9, lines 44-66 and Fig. 6.

Regarding claims 30-32, Gibson et al. disclose a method for treating a substance in cryogen comprising transporting said cryogen from a reservoir (sump 34) into a horizontal flow of said cryogen as described above, depositing a first unit of substance into said horizontal flow of said cryogen at an entry point by nozzles (12), depositing a second unit of said substance into said horizontal flow of said cryogen at said entry

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point wherein said first unit is past said entry point in said horizontal flow such that said second unit does not contact said first unit in said horizontal flow (see Fig. 8), passing said substance and said cryogen into a raceway (trough 22), and separating said substance from said cryogen as described above. Because of the flow of the cryogen and substance, it is inherent that any resulting heat transfer, gasification, or cavitation caused by the introduction of the substance into the cryogen is carried away from said entry point.

9. Claims 1, 3-7, 10, 11, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by US 3228838 (Rinfret et al.). Rinfret et al. disclose an apparatus and method for treating a substance in cryogen comprising transporting said cryogen, which may be liquid nitrogen, from a reservoir (E) into a horizontal flow of said cryogen (defined by upper reservoir 10 and initial tray 6), depositing said substance into said horizontal flow of said cryogen (through nozzles 3), passing said substance and said cryogen into a cascading raceway (trays 9), and separating said substance from said cryogen (by sieving device C). See Fig. 1 and description in column 8. Rinfret et al. further disclose a control means (weir 7) that is equivalent to a dam for adjusting said horizontal flow of said cryogen, said control means (7) inherently slowing down the horizontal flow of said cryogen, reducing any back eddies and/or reverse currents, and creating a generally smooth surface on said cryogen.

10. Claims 1, 3, 7, 10, 12, 17, 19, and 20/19 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5522227 (Appolonia). Appolonia discloses a method and apparatus for treating a substance in cryogen comprising transporting said cryogen,

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which may be liquid nitrogen, from a reservoir (sump 42) into a horizontal flow of said cryogen, depositing a substance into said horizontal flow of said cryogen (see Fig. 1), passing said substance and said cryogen into a linear raceway (trough 20), having a control means (wall 50) that is equivalent to a dam for adjusting said flow of said cryogen, and having said raceway (20) open onto a conveyor belt (52, 54) that is equivalent to a screen (see Fig. 4) such that said substance is separated from said cryogen and said cryogen is passed through said conveyor belt (52, 54) back into said sump (42).

11. Claims 1, 2, 10, 11 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by US 4982577 (Milankov et al.). Milankov et al. disclose a method and apparatus for treating a substance in cryogen comprising transporting said cryogen, which may be liquid nitrogen, from a reservoir (13) by an auger (screw pump 20) to a horizontal flow of said cryogen, depositing a substance (27) into said cryogen through one or more nozzles (30), and passing said substance and said cryogen into a spiral raceway (sluiceway 16), and separating said substance from said cryogen in product/liquid separator (40).

12. Claims 1, 10-13, 17, and 21-24 are rejected under 35 U.S.C. 102(b) as being anticipated by US 6216470 B1 (Kosock et al.). Kosock et al. disclose an apparatus and method for treating a substance in cryogen comprising a container (3) with a reservoir (1) filled with cryogen that may be liquid nitrogen, transporting said cryogen from the reservoir (1) by a pump (2) into a horizontal flow of said cryogen, depositing a substance into said horizontal flow of said cryogen using at least one nozzle (4),

passing said substance and said cryogen into a raceway (5), and separating said substance from said cryogen using a perforated conveyor belt (7). The raceway (5) may be linear (Fig. 1) or cascading (Fig. 3).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 18 and 20/18 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5522227 (Appolonia) in view of US 3405531 (Davis, Jr. et al.). As already discussed above, Appolonia demonstrates all the limitations of the claims except for expressly disclosing that the conveyor belt is wire mesh. Davis, Jr. et al. demonstrate that use of wire mesh conveyor belts in cryogenic applications is already known in the art (column 4, lines 72-74). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the wire mesh conveyor belt taught by Davis, Jr. et al. for the screen conveyor belt in the system disclosed by Appolonia because both were art-recognized alternatives at the time of the invention, both being suitable for separating the substance from the cryogen, as is already well known in the art.

15. Claims 15/12, 15/13, 16/12, 16/13, 26/23, 26/24, 27/23, and 27/24 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6216470 B1 (Kosock et al.) in view of official notice. As already described above, Kosock et al. disclose all the

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limitations of the claims, except for expressly disclosing a raceway with a U-shaped cross-section or a raceway that is a tube. Official notice is taken that having raceways that are U-shaped in cross-section or are tubes is old and well known in the art. It is well known in the art that a U-shaped cross-section has the benefit of simplicity in construction whereas tubes have the benefit of preventing spillage of cryogen out of the raceway. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used either a U-shaped cross-sectioned raceway or a tubular raceway in the apparatus disclosed by Kosock et al. for those or other known reasons. It should be noted that if a tubular raceway were used, an opening should still be provided for the introduction of the substance.

16. Claims 15/14 and 16/14 are rejected under 35 U.S.C. 103(a) as being unpatentable over of US 4982577 (Milankov et al.) in view of official notice. As already described above, Milankov et al. disclose all the limitations of the claims, except for a raceway having a U-shaped cross-section or is a tube. Official notice is taken that having raceways that are U-shaped in cross-section or are tubes is old and well known in the art. It is well known in the art that a U-shaped cross-section has the benefit of simplicity in construction whereas tubes have the benefit of preventing spillage of cryogen out of the raceway. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used either a U-shaped cross-sectioned raceway or a tubular raceway in Milankov et al. for those or other known reasons. It should be noted that if a tubular raceway were used, an opening should still be provided for the introduction of the substance.

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17. Claims 21, 22, 25, 26/25, and 27/25 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 4982577 (Milankov et al.) in view of US 6216470 B1 (Kosock et al.) and official notice. Milankov et al. disclose an apparatus for treating a substance in cryogen comprising a container (12), a reservoir (13) in said container (12), said reservoir (13) filled with a cryogen, which may be liquid nitrogen, a means (20) for removing said cryogen from said reservoir (13), a spiral raceway (16) for transporting said cryogen, at least one nozzle (30) for depositing a substance into said cryogen. While a product/liquid separator (40) is shown, Milankov et al. fails to expressly disclose a conveyor belt is used for separating said cryogen from said substance. Kosock et al. teach a related apparatus wherein a substance is treated in liquid nitrogen and a perforated conveyor belt (7) is used to separate the substance from the liquid cryogen. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the conveyor belt taught by Kosock et al. in place of the product/liquid separator disclosed by Milankov et al. because the perforated conveyor belt is a simple method for both separating and transporting the product out of the apparatus. Milankov et al. further fail to expressly disclose that said raceway has a U-shaped cross-section or is a tube. Official notice is taken that having raceways that are U-shaped in cross-section or are tubes is old and well known in the art. It is well known in the art that a U-shaped cross-section has the benefit of simplicity in construction whereas tubes have the benefit of preventing spillage of cryogen out of the raceway. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used either a U-shaped cross-sectioned

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raceway or a tubular raceway in Milankov et al. for those or other known reasons. It should be noted that if a tubular raceway were used, an opening should still be provided for the introduction of the substance.

18. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6216470 B1 (Kosock et al.) in view of US 3405531 (Davis, Jr. et al.). As already discussed above, Kosock et al. demonstrate all the limitations of the claim except for expressly disclosing that the conveyor belt is wire mesh. Davis, Jr. et al. demonstrate that use of wire mesh conveyor belts in cryogenic applications is already known in the art (column 4, lines 72-74). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the mesh conveyor taught by Davis, Jr. et al. in the apparatus disclosed by Kosock et al. because Kosock et al. suggest that the conveyor belt could comprise any material as long as it is permeable to the cryogen (column 2, lines 8-11).

19. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6216470 B1 (Kosock et al.) in view of US 5522227 (Appolonia). As already discussed above, Kosock et al. demonstrate all the limitations of the claim except for expressly disclosing that the conveyor belt is a screen. Appolonia teaches a related apparatus having a conveyor belt (52, 54) that is equivalent to a screen (Fig. 4) for separating a substance from a fluid cryogen. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the screen conveyor taught by Appolonia in the apparatus disclosed by Kosock et al. because Kosock et al. suggest

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that the conveyor belt could comprise any material as long as it is permeable to the cryogen, such as a perforated belt (column 2, lines 8-11).

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 4843840 (Gibson): discloses a freezing apparatus for treating a substance with liquid nitrogen comprising a reservoir, an auger pump, a raceway, nozzles, and a separation device, and further discloses the use of channels having U-shaped cross-sections.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard L. Leung whose telephone number is 703-306-4154. The examiner can normally be reached on Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Denise L. Esquivel can be reached on 703-308-2597. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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